BEFORE THE COMMISSIONERS APPOINTED BY THE DUNEDIN CITY COUNCIL

LUC-2020-293

IN THE MATTER of 20 Bay Road, Warrington

BETWEEN **NEW ZEALAND MOTOR CARAVAN ASSOCIATION**

Applicant

BRIEF OF EVIDENCE OF JEREMY TREVATHAN (NOISE) FOR NEW ZEALAND MOTOR CARAVAN ASSOCIATION

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BRIEF OF EVIDENCE OF JEREMY TREVATHAN

QUALIFICATIONS AND EXPERIENCE

1. My name is Jeremy William Trevathan. I am an Acoustic Engineer and Director of Acoustic Engineering Services Limited, an acoustic engineering consultancy based in Christchurch. I hold the degrees of Bachelor of Engineering with Honours and Doctor of Philosophy in Mechanical Engineering (Acoustics) from the University of Canterbury. I am an Associate of the New Zealand Planning Institute, and a Member of the Acoustical Society of New Zealand.

2. I have more than fifteen years' experience in the field of acoustic engineering consultancy and have been involved with a large number of environmental noise assessment projects throughout New Zealand. I have previously presented evidence at Council and Environment Court Hearings, and before Boards of Inquiry. I have acted on behalf of applicants, submitters and as a peer reviewer for Councils.

3. While this matter is not before the Environment Court, I have read and agree to comply with the Code of Conduct for Expert Witnesses (Environment Court Practice Note 2014). I confirm this evidence is within my area of expertise, except where I state I am relying on facts or information provided by another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

BACKGROUND

4. In July 2021, my company was engaged by NZMCA (the Applicant) to provide acoustic engineering advice in relation to a proposal for a campsite for up to 60 self-contained vehicles or caravans at 20 Bay Road, in Warrington.

5. I have reviewed the application and have analysed the noise levels expected from the activity based on previous measurements and experience.

6. I have also reviewed the Submissions and Council Officers reports in relation to the noise effects. I have attached to this evidence a document titled *NZMCA Weedons Park Noise Emissions*, produced by WSP, and dated the 30th of October 2019, which I refer to in the following sections.

SITE AND PROPOSED ACTIVITY

Site and locality

7. The site is located at 20 Bay Road, in Warrington. Access to the site is down a long accessway from Bay Road between 10 and 16 Bay Road to the west and 22 and 24 Bay Road to the east. This accessway is approximately 17 metres wide and 135 metres long.

8. The applicant site has split zoning under the 2GP Dunedin District Plan. The accessway and the majority of the site is zoned Township and Settlement, with a portion to the southwest zoned Coastal Rural. The surrounding sites adjoining the accessway are also within the Township and Settlement zone, with those to the east and south of the main site zoned Coastal Rural.

9. The adjoining Coastal Rural zoned site is the Warrington Recreation Domain. While this site directly adjoins the applicant site, the area between the applicant site and the Esplanade (road) is largely vegetation. The area on the opposite site of the Esplanade is a designated freedom camping area, approximately 30 metres from the applicant site boundary.

Proposed activity

10. The proposal is for a camping site for provision for 60 self-contained motorhomes and caravans on the site. This will be limited in use to NZMCA members and will be on a temporary basis only.

11. The existing accessway from Bays Road will be upgraded as part of the development, and this will be the main access point to the site. As a noise mitigation measure, NZMCA are proposing to fully seal the driveway down its length. This is expected to reduce the noise levels

from the vehicles when received at the neighbouring properties by up to 5 dB, compared to a gravel driveway.

12. The main parking area will be located to the southeast of the site. The proposed layout will initially comprise of 36 spaces for larger vehicles, and 20 spaces for smaller vehicles. The size of the members vehicles varies from relatively small campervans through to large fifth wheelers (e.g. a camper trailer connected in the bed or a truck or large towing ute). I understand that the current registered NZMCA vehicles are split as follows:

    - Motorhomes / campervans 52 %
    - Caravans 38 %
    - Converted buses 8.5 %
    - 5th wheel (large caravans) 1.5 %

13. Based on the evidence of Mr Rossiter I understand peak expected vehicle movement numbers are 80 vehicles per day, 15 in a peak hour and 3 during the night time period. For the majority of the year, movement numbers will be much lower.

ACOUSTIC CRITERIA

14. In this section I have considered what noise levels may be appropriate for the proposal. There are a number of sources of guidance available with regard to what appropriate noise levels for the activity may be.

Dunedin City Council 2nd Generation District Plan (2GP)

15. As described above, the majority of the site and those to the north, and east and west of the accessway are zoned Township and Settlement. Therefore, the noise standards that apply at these sites are those described in the 2GP, Chapter C: City-wide Provisions, 9 Public Health and Safety, 9.3 Performance Standards, 9.3.6 Noise, and are as follows:

Noise level measured at the boundary of the receiving property:

7.00am to 7.00pm	*50 dB LAeq (15 min)*
7.00pm to 10.00pm	*45 dB LAeq (15 min)*
10.00pm to 7.00am	*40 dB LAeq (15 min) & 70 dB LAFmax*

I note that Rule 9.3.6(7)(e) exempts noise generated as part of normal residential activities from these limits.

16. The sites to the east and south of the main portion of the site are zoned Coastal Rural. The 2GP noise limits which apply at these sites are those described in the 2GP, Chapter C: City-wide Provisions, 9 Public Health and Safety, 9.3 Performance Standards, 9.3.6 Noise, and are as follows:

Noise level measured at property boundaries of rural zones where there are no noise sensitive activities within 20 metres of boundary:

7.00am to 7.00pm	*60 dB LAeq (15 min)*
7.00pm to 10.00pm	*60 dB LAeq (15 min)*
10.00pm to 7.00am	*60 dB LAeq (15 min) & 85 dB LAFmax*

17. The 2GP states that noise must be measured and assessed in accordance with the provisions of NZS 6801:2008 Acoustics – Measurement of Environmental Sound, and NZS 6802:2008 Acoustics – Environmental Noise.

NZS 6802:2008 Acoustics – Environmental noise

18. NZS 6802:2008 outlines a guideline daytime limit of 55 dB LAeq (15 min), an evening limit of 50 dB LAeq (15 min), and a night-time noise limit of 45 dB LAeq (15 min) for “the reasonable protection of health and amenity associated with the use of land for residential purposes”.

World Health Organisation Guidelines for Community Noise (1999)

19. *Guidelines for Community Noise*, a document produced by the World Health Organisation (WHO) based on extensive international research recommends a guideline limit of 55 dB LAeq (16 hours) to ensure few people are seriously annoyed in residential situations during the daytime and evening. A guideline limit of 50 dB LAeq (16 hours) is recommended to prevent moderate annoyance. A guideline night time noise limit of 45 dB LAeq (8 hours) outside dwellings is recommended to avoid sleep disturbance.

Conclusions regarding appropriate noise levels

20. Based on the above, I consider that compliance with the noise limits outlined in the 2GP would be conservative and ensure noise effects are minimal. In addition, I consider that provided they did not occur regularly, brief periods of higher noise would only have a minor effect – noting that the 2GP limits are lower than the other amenity and sleep disturbance guidance discussed above, which are also typically applied to on-going noise emissions. As noted above the 2GP limits exclude noise generated as part of normal residential activities from these limits

EXPECTED NOISE LEVELS

Proposed mitigation

21. Expected noise levels associated with the proposed campsite have been calculated taking into account the following mitigation:

    - The accessway from Bay Road will be sealed.

    - On-site generators will be limited to be used only between 8.00am and 8.00pm.

    - Noise management measures will put in place via the members' Travel Directory (publication, website and app versions) and a sign inside the kiosk. The Travel Directory will advise members to *"Please arrive and depart the site between 7 am and 7 pm only".* The kiosk sign will remind members that *"Warrington is a small settlement community, and its residents enjoy living a peaceful*

lifestyle. Please keep this in mind while enjoying your stay here, including planning your arrival and departure times within daytime hours only (7 am to 7 pm).”

Noise generated by typical activity on the site

22. Potential noise sources associated with the operation of the campsite are expected to be:

    - Noise associated with people,
    - Noise from vehicles on the site and;
    - Noise from onsite temporary generators.

    I have considered noise from each of these sources in the following sections.

Noise from people

23. The WSP report describes the type of activity that is typically observed on a NZMCA site, as follows: *“When on site, members spent most of their time inside their vehicles (the weather was fine, but cold). Quiet conversations took place between members walking around the site during the day time, but these were limited to 2 or 3 people at a time.”* I consider that the proposed managerial controls are appropriate to ensure that this level of activity remains representative of what will occur on site. I understand that NZMCA sites have a long history of operating successfully in residential areas.

24. While there may be sound generated by small groups of members talking on the site, I expect that this will largely be self-regulated by the other campers on the site (caravans and campervans offer a lower level of sound insulation than a dwelling – so campers will readily heard by, and aware of, the other campers around them). By contrast, the nearest proposed parking space is more than 70 metres from the nearest residential zoned properties. I expect that noise from people talking on the site in the vicinity of their campers to fully comply with the 2GP residential noise limits at all times, and have a minimal effect.

25. I also expect that the boundary noise limit of 60 dB LAeq for the Coastal Rural zones to the east and south will be achieved provided there are not sustained periods of noise emission very close to the boundary.

Noise from vehicles

26. I have also assessed noise from vehicles travelling on the accessway between Bay Road and the main site area.

27. Based on the traffic engineering report, during a peak hour during peak season, up to 15 vehicle movements could be expected. A peak hour during off season would be up to 5 vehicle movements.

28. As outlined above, a range of vehicles are expected on the site. Based on the measurements undertaken by WSP (as outlined in their memo) and my experience, my analysis has been based on the following sound powers of the NZMCA vehicles travelling at 10 km/hr on a sealed surface:

- Motorhomes / campervans (52 %) 95 dB LwA
- Vehicles towing caravans (38 %) 90 dB LwA
- Converted buses (8.5 %) 100 dB LwA
- 5th wheel vehicles (large caravans) (1.5 %) 100 dB LwA

29. My analysis indicates that during the daytime period, under the majority of scenarios when assessed in line with NZS6802:2008 compliance with the daytime noise limit of 50 dB LAeq would be expected at the neighbouring boundaries. However, if more than one bus or 5th wheel vehicle travelled on the access way during a single 15-minute period, or if one travelled on the accessway in conjunction with multiple other vehicles within a single 15-minute period, a small (1 - 2 dB) exceedance of the daytime noise limit would be expected. If this did occur, noise levels of 50 dB LAeq or less would be expected within the vicinity of any of the dwellings – including outdoor living areas. This remains in line with the NZS6802 and WHO guidance for residential

amenity. I also understand from the evidence of Mr Rossiter and Ms Bombay that a ‘permitted baseline’ residential development on the site may involve 120 vehicle movements per day. This level of activity would be expected to generate similar daytime noise levels to those I have described above.

30. As described by Mr Rossiter, the traffic count data from other NZMCA sites indicate that very low traffic volumes are expected during the night-time period, even during the peak season where there may be up to 3 ‘night time’ movements.

31. During the night-time period, if a motorhome or caravan travelled on the accessway I expect noise levels of up to 46 dB LAeq at the nearest site boundary, which exceeds the 2GP limit. However, noise levels of less than 45 dB LAeq would be expected at the façade of all neighbouring dwellings – therefore based on the guidance discussed above sleep disturbance would not be expected. There is also a 70 dB LAFmax limit during the night time period, which would be exceeded at the site boundary, but complied with at dwelling facades.

32. Higher noise levels would be expected to occur if a converted bus or a 5th wheel vehicle travelled on the accessway during the night time period. However, as above, very few night time movements are expected of any vehicle type, and these vehicles only make up 10 % of the owner fleet. These occurrences are therefore expected to be very rare (1 – 2 per week, during peak season) and so any resulting noise effect will only be minor. Many dwellings are subjected to occasional night time higher noise events of this type, for example from cars with modified exhausts or an emergency vehicle driving by, or helicopter movements. The evidence of Mr Rossiter also confirms that more regular night-time vehicle movements would actually be associated with a ‘permitted baseline’ residential development on the site, with typically 6 vehicle movements per night.

33. As above, noise management measures are proposed to ensure night time vehicle movements remain low, with campers being encouraged

to arrive / depart the site within the daytime period via the members' Travel Directory and a sign inside the kiosk.

Noise from generators

34. The existing NZMCA policy for generator use for *"a maximum of two 2-hour stints between 8.00am and 8.00pm."* This policy will be in place for the Warrington site.

35. WSP carried out measurements of three generators at the NZMCA Weedons Park site. The maximum noise level from these three measurements outlined in the WSP memo was 88 dB LwA. Based on this sound power, these types of generators would comfortably comply with the 2GP daytime and evening noise limits at neighbouring residential properties.

36. Provided the generators were not within 10 metres and had direct line of sight of the neighbouring rural zoned boundary, compliance with the 60 dB LAeq noise limit would also be achieved.

Conclusions regarding effects

37. Based on the above, I expect that with the implementation of the recommended mitigation measures, noise associated with the proposed campsite will generally comply with the 2GP noise limits when measured and assessed in accordance with NZS 6801:2008 and NZS 6802:2008. Vehicles on the accessway may however generate non-compliances from time to time, however at these times noise is either still expected to comply with guidance regarding the protection of amenity and sleep disturbance, or where higher levels are expected, occur very infrequently. I therefore expect the effect of noise associated with the proposal to be minimal.

REVIEW OF SUBMISSIONS

38. Four opposing submissions have been received for this application, three of which mention noise as a concern. These three submissions are from the four properties directly adjoining the accessway to the site. Specific concerns raised are as follows:

- Noise from vehicles travelling on the accessway
- That they can already hear activity from the freedom camping site and this one will be closer
- Noise from generators
- Noise from vehicles stopping and idling outside their houses while they open the gate
- Noise from 120 people on the site

I have discussed a number of these concerns above. I have the following additional comments.

39. The submitters residing at 10, 16 & 24 Bay Road are concerned about the noise generated by the vehicles idling in the accessway while the access gate is opened and closed. Mr Imlach has advised me that based on the location of the site, and the proposed signage, it is expected that for the majority of the time the gate will remain open, with NZMCA members able to access/leave the site without unlocking and opening the gate. I understand that at certain times of the year the custodians may close the gate, such as if the park is full, or if there is a public event nearby. Therefore, the idling of vehicles while the gate is opened or closed is not expected to be part of the day-to-day activity.

40. The submitter residing at 22 Bay Road discusses the existing noise from the nearby freedom camping facility. I note that the 2GP noise limits do not reduce noise to an inaudible level. Therefore, while full compliance with the noise limits may be achieved, noise from the site is still likely to be audible. There are no restrictions imposed on a freedom camping site, where anyone can stay and there is no control. By contrast, as I have described above the NZMCA has multiple methods for managing those who stay at their sites. I therefore expect the noise levels associated the NZMCA site to be lower than the unrestricted noise from the adjoining freedom camping site.

41. The submitters residing at 10 & 16 Bay Road note concerns about the potential noise from up to 120 people on the site. As outlined above,

based on other NZMCA sites and the managerial controls proposed, the noise levels generated by people on the site are not expected to be elevated and full compliance with the 2GP noise limits are expected at both 10 & 16 Bay Road. In addition, I note that the proposed layout of the camping area, has the main camping area to the southeast of the larger property, ensuring that the camping activity occurs at the greatest distance from the residential neighbours. This layout results in the nearest camping area being approximately 80 metres from the 10 Bay Road site. Based on this distance, even if all 120 people were outside with half speaking in raised voices (which is not expected to occur) full compliance with the daytime noise limit would still be achieved at this property.

COUNCIL OFFICER'S REPORT

42. Robert Buxton, a Consultant Planner at the Dunedin City Council has prepared a Section 42a report which includes a discussion based on a Noise Report prepared by a Council Environmental Health Officer (EHO).

43. The EHO considers that "*increased traffic to the site and the potential from noise from vehicles is unlikely to cause noise issues such as disrupting sleep to any residential dwellings or cause additional impact on the current receiving environment*." As outlined above, with the proposed mitigation in place I agree with this statement.

44. However, a condition of consent is proposed which restricts vehicles coming and going within the 2GP night-time period, and a recommendation to campers to not arrive and depart within the evening period. As outlined in the traffic evidence, very few vehicle movements occur within the night-time period without any particular restrictions. Management measures are proposed to discourage vehicle movements during the night time period. I understand that a complete prohibition is not considered to be practicable. As described above, I expect the effect of some infrequent night time vehicle movements on the site accessway to only be minor.

CONCLUSIONS

45. I have considered noise likely to be associated with the propose NZMCA campsite development at 20 Bay Road, in Warrington.

46. Noise effects will be mitigated by the physical layout of the site, the sealing of the driveway, along with the implementation of noise management measures.

47. Based on the above, I expect that noise associated with the proposed campsite will generally comply with the 2GP noise limits when measured and assessed in accordance with NZS 6801:2008 and NZS 6802:2008. Vehicles on the accessway may however generate non-compliances from time to time, however at these times noise is either still expected to comply with guidance regarding the protection of amenity and sleep disturbance, or where higher levels are expected, occur very infrequently. I therefore expect the effect of noise associated with the proposal to be minimal.

Jeremy William Trevathan

24 August 2021

Attachment 1: *NZMCA Weedons Park Noise Emissions*, produced by WSP, and dated the 30th of October 2019

Memorandum

To	James Imlach
From	Richard Jackett
Office	Petone
Date	30/10/2019
File	3-C1629.00 00007 02
Subject	NZMCA Weedons Park Noise Emissions

Introduction

The New Zealand Motor Caravan Association Inc. (NZMCA) operates a member-only vehicle-based campground at 286 Jones Road, Rolleston (Figure 1) named Weedons Park. The site is consented to accommodate up to 130 motorhomes at any one time.

I was engaged by NZMCA to undertake 24-hour noise monitoring of the ambient noise level at Weedons Park in September 2019 to inform expert noise evidence in support of the NZMCA's submission on the nearby Roydon Quarry application. Whilst on site I also conducted additional noise measurements of campground activities with the intention of informing future noise assessments of NZMCA parks. This memo summarises my observations of campground activities and provides measurements of their noise emissions.

Methodology

All noise measurements were made between 10:30am on 10 September and 10:30am on 11 September 2019. The 24-hour sound level meter (SLM) was positioned in the northern-most corner of the NZMCA site (Figure 1). Other measurements were undertaken at various locations within the site.

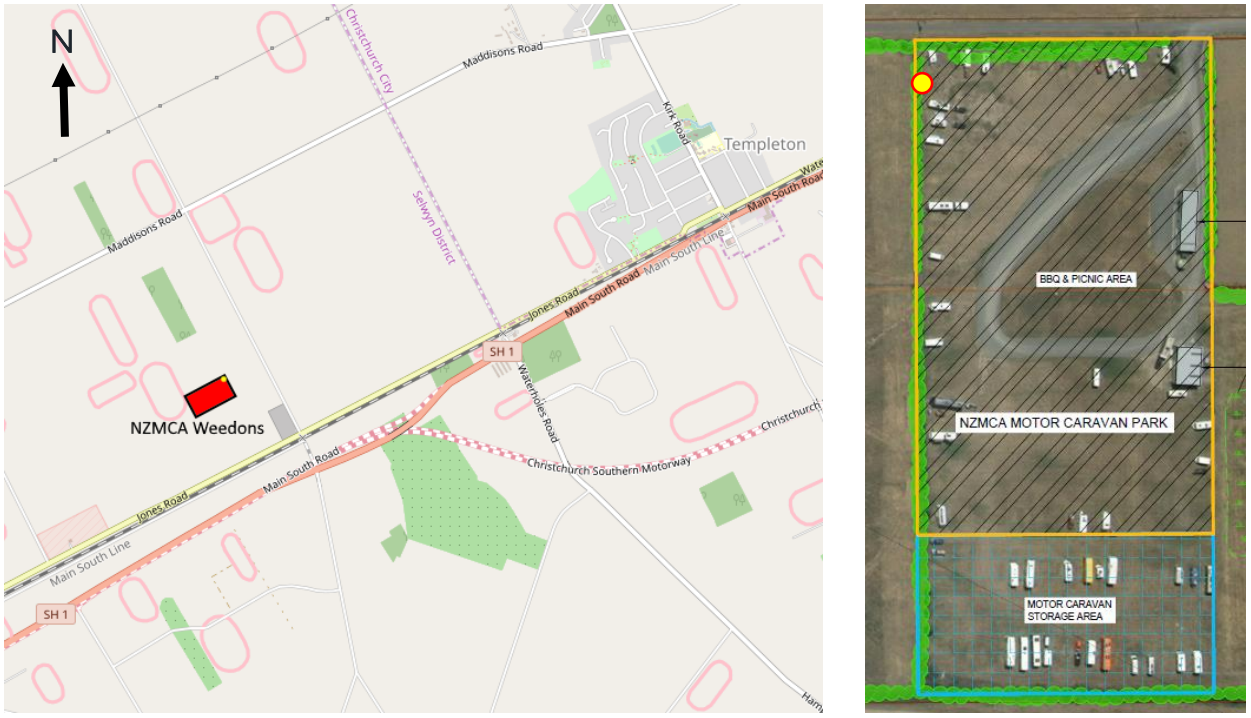

Figure 1: Location of the Weedons NZMCA Park (left) and the site plan (right) showing the 24-hour noise monitoring location as a yellow dot.

The instrumentation used was:

- Rion NL-32 Sound Level Meter, S/N: 00851394 (calibrated 11/7/19) [24-hour]
- Bruel & Kjaer 2250 Sound Level Meter, S/N: 3027649 (calibrated 10/1/19)
- Norsonic Nor1256 Sound Calibrator, S/N: 125626168 (calibrated 11/7/19)
- Davis Instruments TurboMeter wind speed indicator

The weather remained cold and fine throughout, and windspeeds were between 1 m/s to 4 m/s during my noise measurements of campground activities.

Observations

The noise environment at NZMCA Weedons Park was dominated by noise generated off-site, and could be summarized as "working-rural, with distant highway traffic, occasionally punctuated by passing trains and aircraft".

When on site, members spent most of their time inside their vehicles (the weather was fine, but cold). Quiet conversations took place between members walking around the park during the day time, but these were limited to 2 or 3 people at a time. Members mentioned that on nice days they might enjoy 'happy hour' on the benches outside the shed, but this did not happen when I was on site.

There were some dogs present but no barking was heard over the entire time I attended the site.

Vehicle traffic in and out of the site occasionally generated low levels of noise. This was a mix of cars and utes (going out for the day or for supplies) and towed or self-powered motorhomes arriving or leaving the park.

I observed a total of 28 motorhomes and caravans staying overnight on the site during the survey. Two generators were in operation between 5pm and 8pm on 10 September. Members appeared to prefer to operate their generators in the morning from about 9am onwards. A maximum of 3 generators were operating at any one time in the morning. Members noted that generator usage was sometimes necessary in winter, but they preferred to charge caravan batteries at powered sites, from solar panels (viable in summer), or from driving/idling their vehicles. Generator usage appeared to generally follow the NZMCA policy of 'a maximum of two 2-hour stints between 8am to 8pm'.

I observed no noise-generating activity on site after 8pm (I departed after 10pm), except for a few vehicles quietly arriving or leaving.

The 6 or 7 members I spoke with indicated that the peacefulness of the park was a key factor in their decision to visit the site. All members that were operating generators appeared to be knowledgeable about how loud their generator was compared with other generators on the market. The "Honda" was mentioned as being the quietest by two non-Honda owners.

Results

24-hour noise survey

The ambient noise level at NZMCA Weedons Park is not especially relevant to the noise emission of the park, because it is dominated by activities occurring off-site, particularly road traffic noise from SH1 and aircraft overflights to and from Christchurch airport. However, the results are included for completeness in Table 1 below. The L_{Aeq} noise level represents an 'energy average' of noise over the given time period, which is strongly influenced by the loudest noise events (e.g. aircraft), whereas the $L_{90(15min)}$ parameter represents the 'background' noise level (e.g. the hum of road traffic).

Table 1: Noise levels at NZMCA Weedons over different periods of a 24-hour survey

Time	Period	Duration, t (hours)	Noise Level (dB $L_{Aeq(t)}$)	Background (dB $L_{90(15min)}$)
6am – 7am	Early Morning	1	53.3	49.9
7am – 6pm	Day	11	51.2	46.6
6pm - 8pm	Early Evening	2	49.3	45.4
8pm – 10pm	Late Evening	2	49.6	41.5
10pm - 6am	Night	8	47.4	38.0

Generator noise

Noise measurements of three generators operating under load were obtained and are presented below for the standard separation distance of 7-metres:

Generator Make/Model	***Noise Level*** $dB\ L_{Aeq(1\ min)}$ *@ 7m*
Newman 1000W	61
Ryobi 1600W (full load)	63
Honda (on ute, model not available)	59

Each generator had a different tone. The Honda was noticeably deeper than the others, and was subjectively less obtrusive. It was mounted within the flatbed of a ute instead of on the grass like the other generators, so the actual emission level may be slightly lower (in the absence of reflections from the ute tray).

Vehicle drive-by noise

The typical vehicle drive-by sound level on gravel was 75 dB L_{Amax} at 7 metres from the nearside wheel path. Engine noise contributed at low frequencies, but the crunch of the gravel was the dominant source in determining the maximum drive-by level.

Conclusions

- There is some variation between noise emission levels of gas-powered generators. The noise emission of a single generator at full load may be conservatively estimated as 63 dB $L_{Aeq(15min)}$ at 7-metres.
- Members reported that they use powered sites and solar panels in preference to gas-powered generators, but that sometimes generator usage was necessary, particularly in winter. My observations from a 24-hour period in winter was that out of 28 over-nighting motorhomes and caravans:
  - Four members operated generators.
  - A maximum of three generators operated at one time (spread across the site).
  - No single generator operated for more than 2.5 hours at a time.
  - No generators operated outside of the allowed hours of 8am to 8pm.
- A conservative value for vehicle drive-by noise may be taken as 75 dB L_{Amax} at 7-metres from the nearside wheel path.
- While I was in attendance I observed some conversations occurring between members, but this was at a low level and would not have been audible from outside of the site. I did not hear any shouting or barking at any time over the 24-hour survey.